Fig 1: Registration of a user to OTS

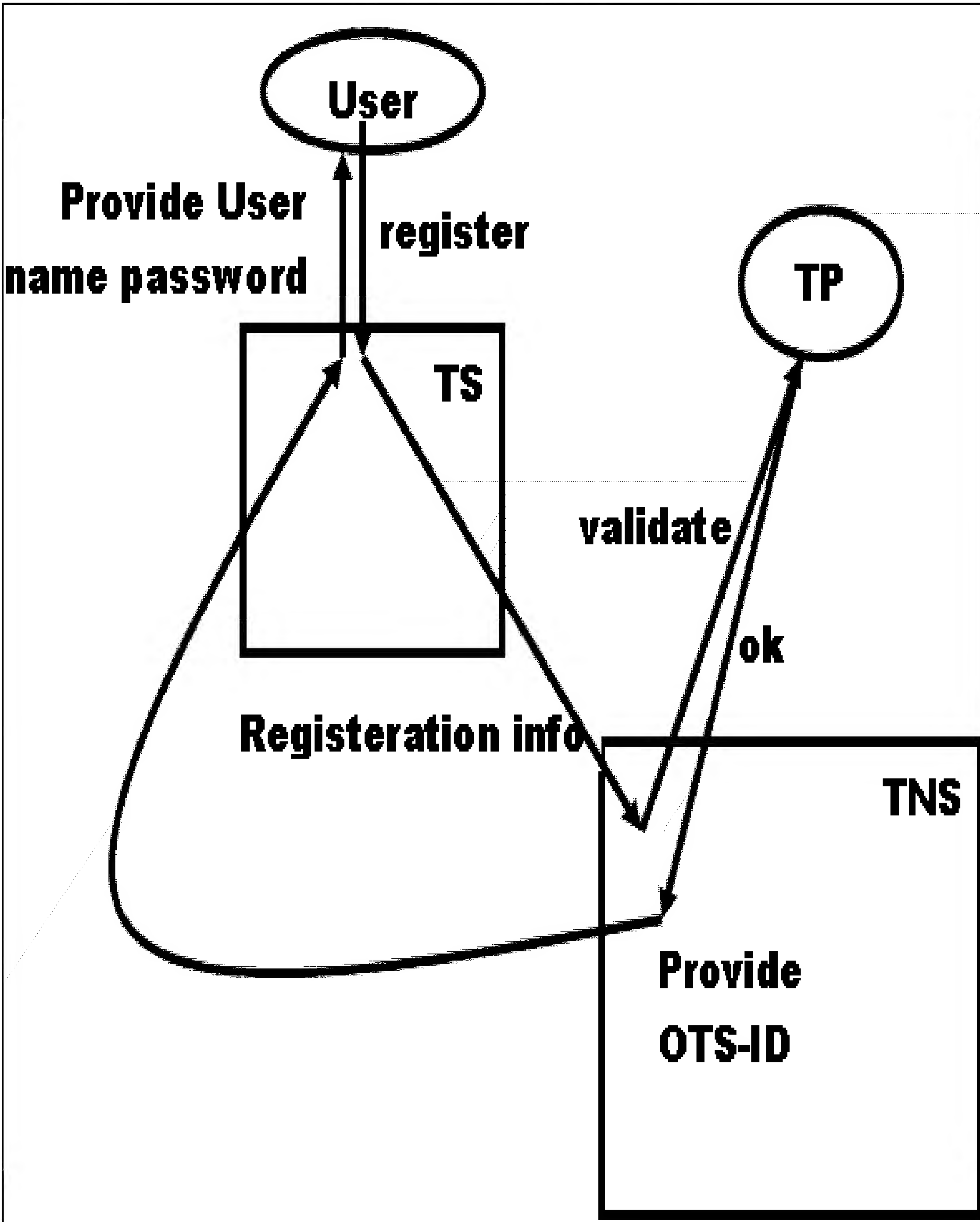User

Provide User
name password

register

TP

TS

validate

ok

Registeration info

TNS

Provide
OTS-ID

Fig 2: communication in OTS

User id

Log in to TS 1

TS 1

Send a transcript to user's UUID.

Assign sender OTS-ID by matching user name to OTS-ID

Look up UUID

Send message, with sender OTS-ID and receiver OTS-ID to TNS

TNS

Return receiver OTS-ID for UUID

Find hosting TS for receiver OTS-ID and forward message to TS hosting receiver OTS-ID

TS 2
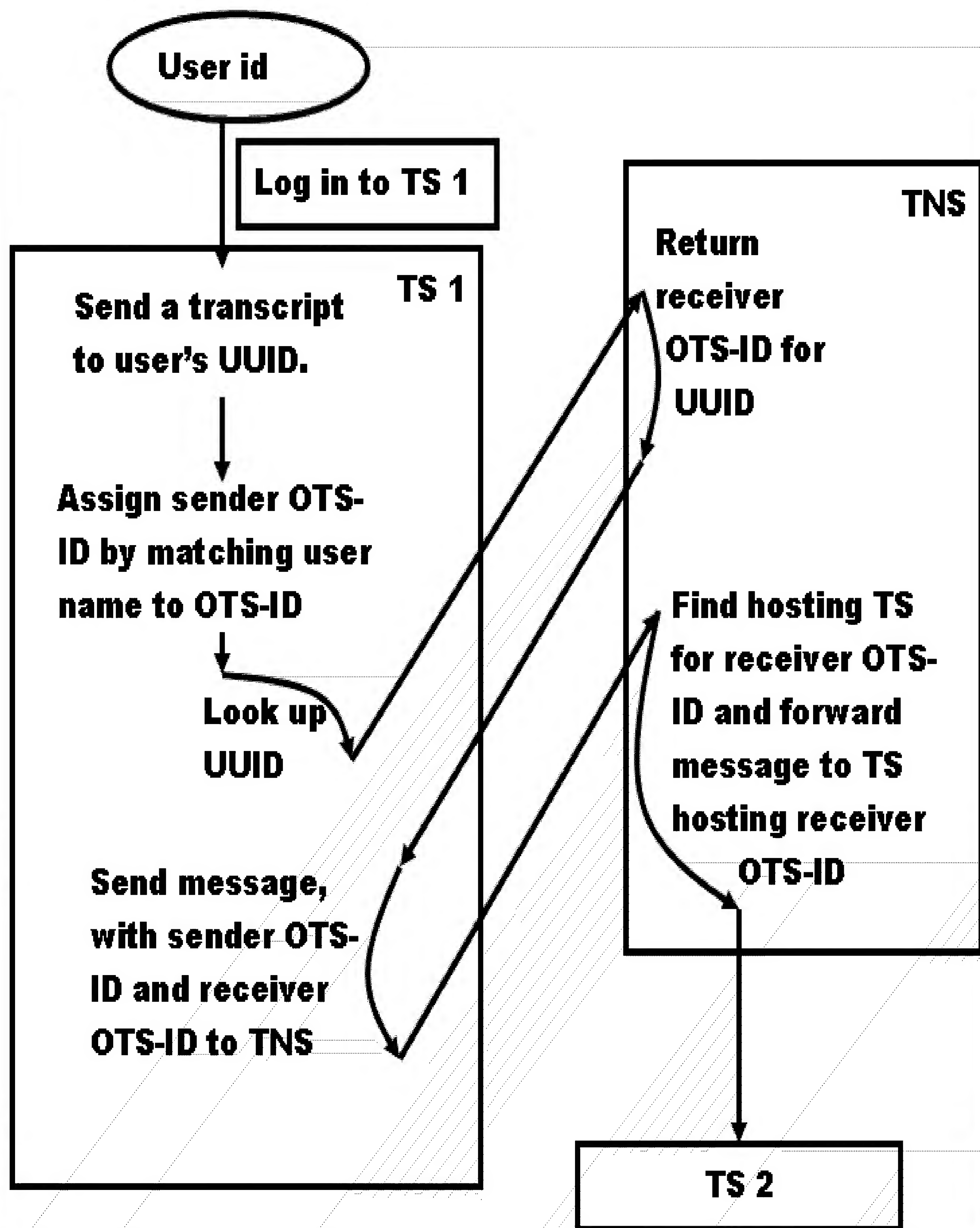
Fig 3: User Types, Roles and Action

TYPE

User A - > Company

User B - > Individual

User C - > Company

User D - > Company

T1 -> Transcript 1 created by A, A——>Issuer——> for T1

T2 -> Transcript 2 created by A, A——>Issuer——> for T1

ROLE

ACTION

A————>Issue————>B   B—>Applicant—> for T1

B————>Submit————>D   D—>Reviewer—> for T1

A————>Issue————>C   C—>Applicant—> for T2

C————>Submit————>D   D—>Reviewer—> for T2

A   B   D   A   C   D

View

T1   T2
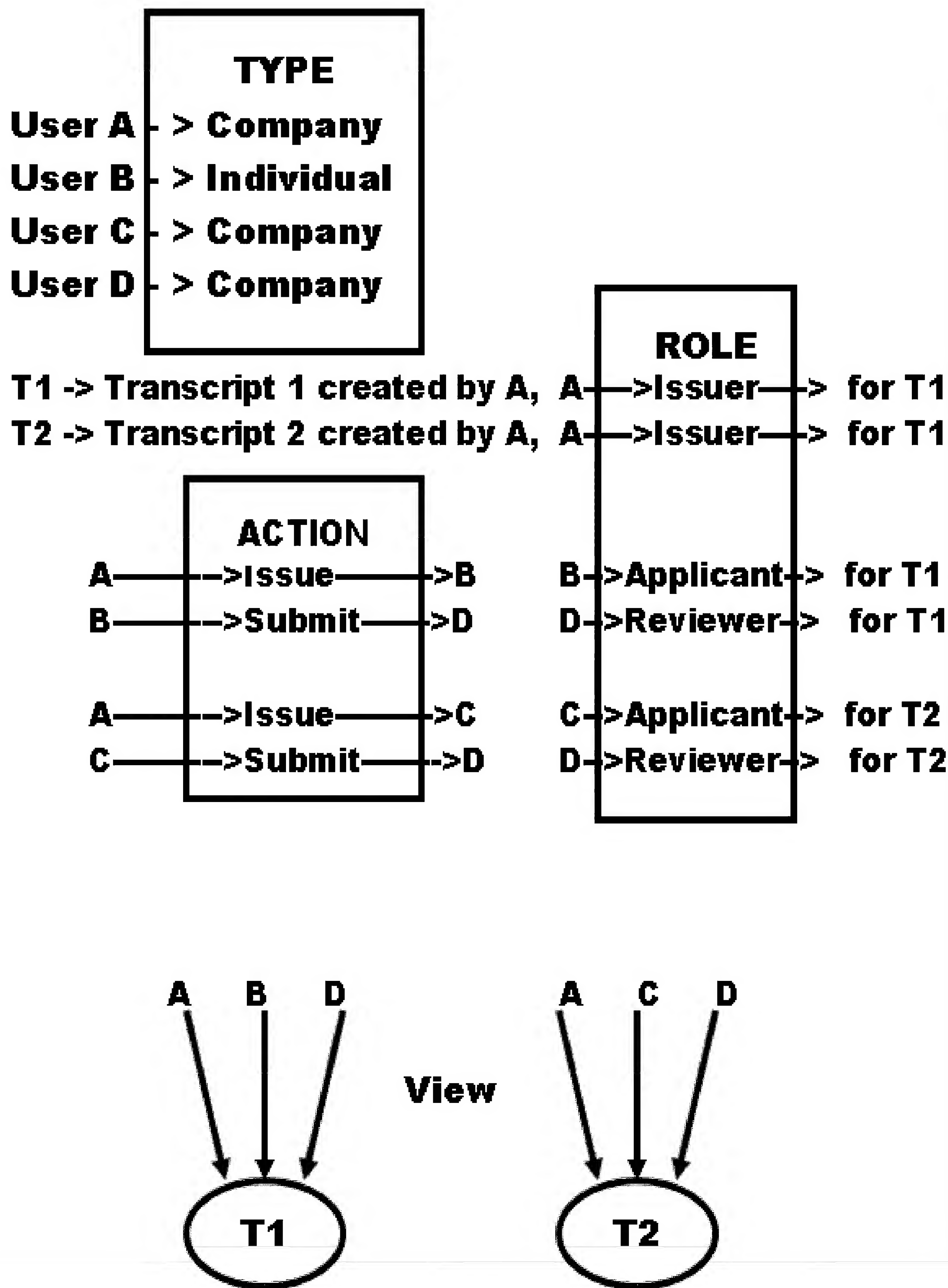
Fig 4: RTL formation

OTS-ID A -> Issuer of Transcript T1
OTS-ID B -> Applicant of Transcript T1
OTS-ID D -> Reviewer of transcript T1

A located on TS1
B located on TS2
D located on TS4

On TS1.
A-Table contains
    RTL=123,
       sender OTS-ID=self
123-transfer-table contains
       local path=123/T1,
       remote path=self,
       remote OTS-ID=self

issue

On TS2.
B-Table contains
       RTL=123@A,
       sender OTS-ID=A
123@A-transfer-table contains
       local path=123@A/T1,
       remote path=123/T1,
       remote OTS-ID=A

submit

On TS4.
D-Table contains
       RTL=123@A@B,
       sender OTS-ID=B
123@A@B-transfer-table contains
       local path=123@A@B/T1,
       remote path=123@A/T1,
       remote OTS-ID=B

Fig 5: EFT OTM

EFT OTM sent when TS1 issues to TS2

TS1 →

Type=EFT

Sender OTS-ID=A

Receiver OTS-ID=B

RTL Name=123

RTL Description="transcripts to B"

Path1= 123/T1

Role1= A:Issuer, B:Applicant

Desc1="transcript T1"

→ **TS2**

EFT OTM sent when TS2 submits to TS4

TS2 →

Type=EFT

Sender OTS-ID=B

Receiver OTS-ID=D

RTL Name=123@A

RTL Description="transcripts to B"
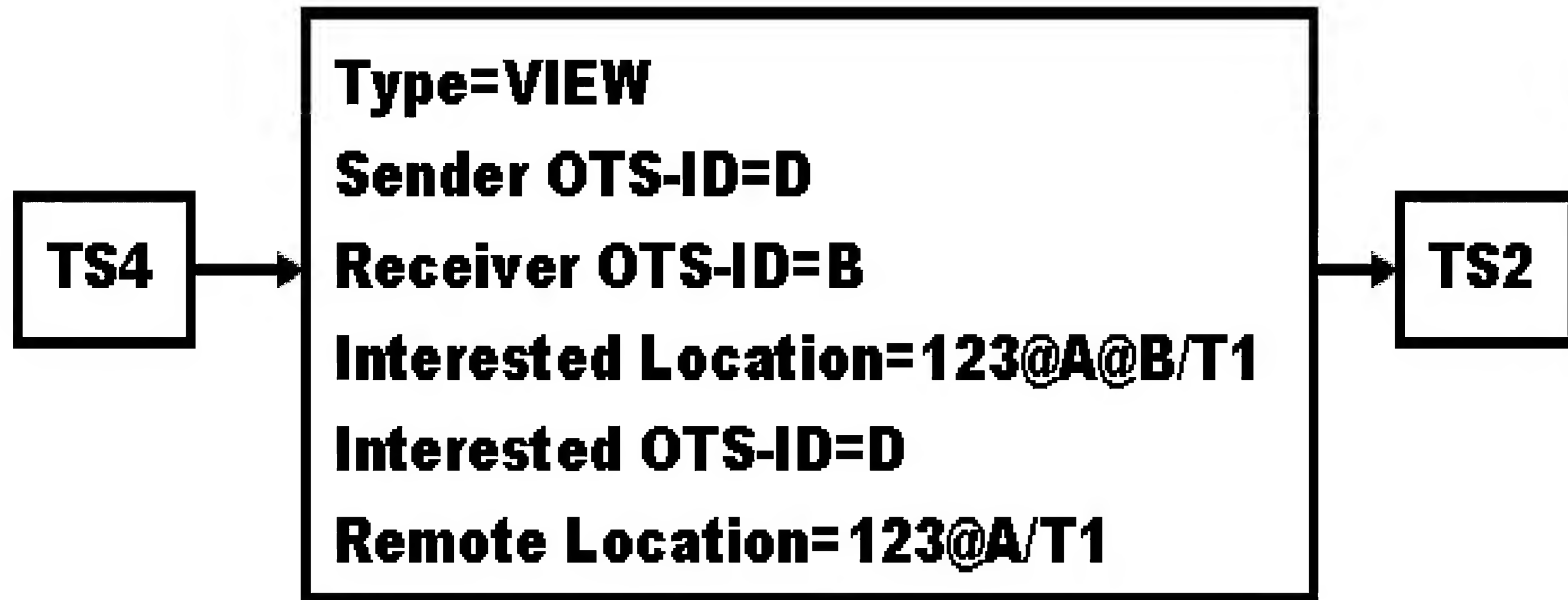
Path1= 123@A/T1

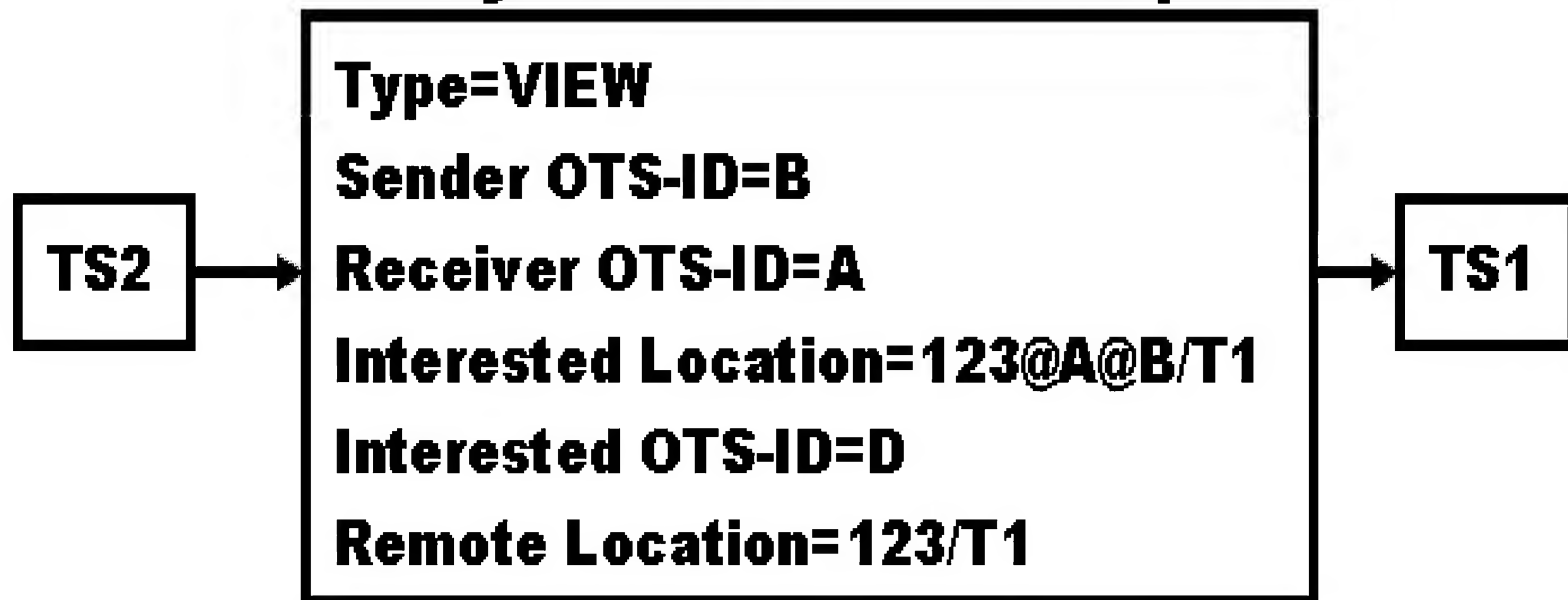Role1= A:Issuer, B:Applicant,

D:Reviewer

Desc1="transcript T1"

→ **TS4**

View OTM sent to TS2 by TS4 when D views T1

TS4 →

Type=VIEW

Sender OTS-ID=D

Receiver OTS-ID=B

Interested Location=123@A@B/T1

Interested OTS-ID=D

Remote Location=123@A/T1

→ TS2

View OTM sent to TS1 by TS2 to for the view request from D

TS2 →

Type=VIEW

Sender OTS-ID=B

Receiver OTS-ID=A

Interested Location=123@A@B/T1

Interested OTS-ID=D

Remote Location=123/T1

→ TS1

View OTM sent to TS1 by TS2 when B views T1.

TS2 →

Type=VIEW

Sender OTS-ID=B

Receiver OTS-ID=A

Interested Location=123@A/T1

Interested OTS-ID=B

Remote Location=123/T1

→ TS1
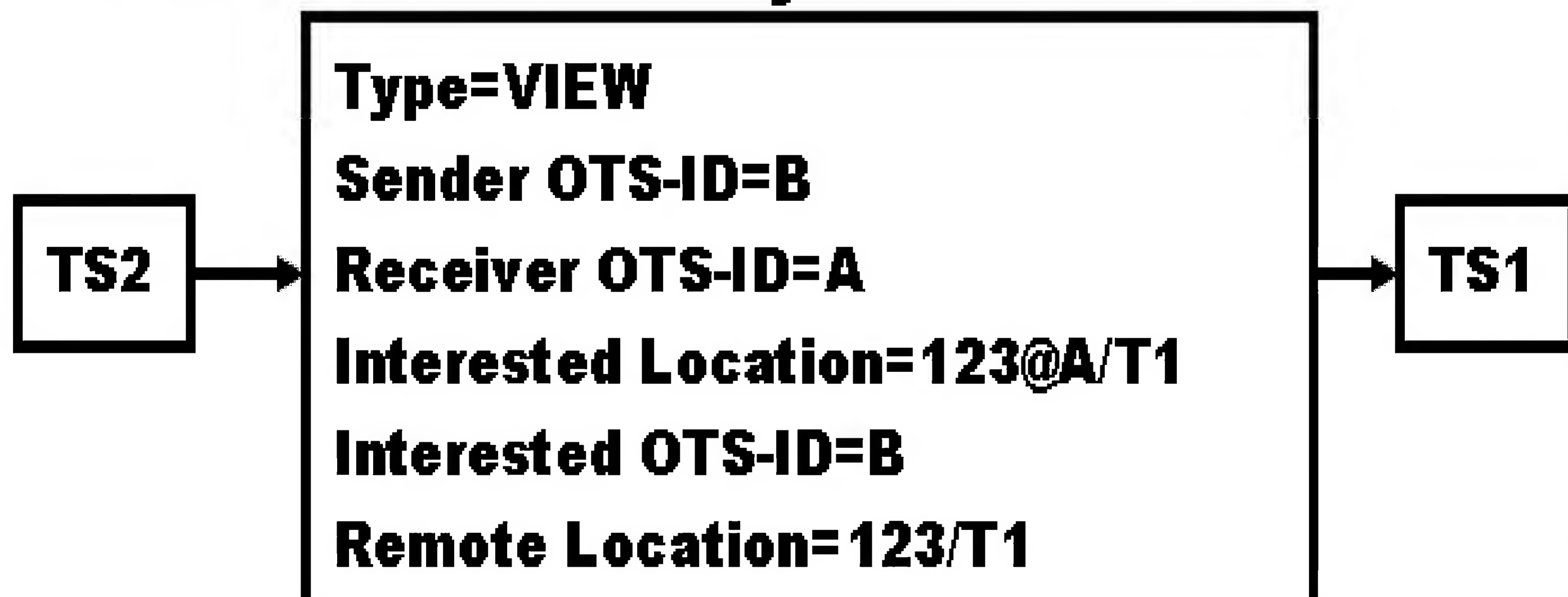
Fig 7: TRANSFER OTM

Transfer OTM sent byTS1 to TS4 that completes the view request by D.

TS1 →
```
Type=TRANSFER
Sender OTS-ID=A
Receiver OTS-ID=D
Interested Location=123@A@B/T1
<Actual transcript byte stream>
```
→ TS4
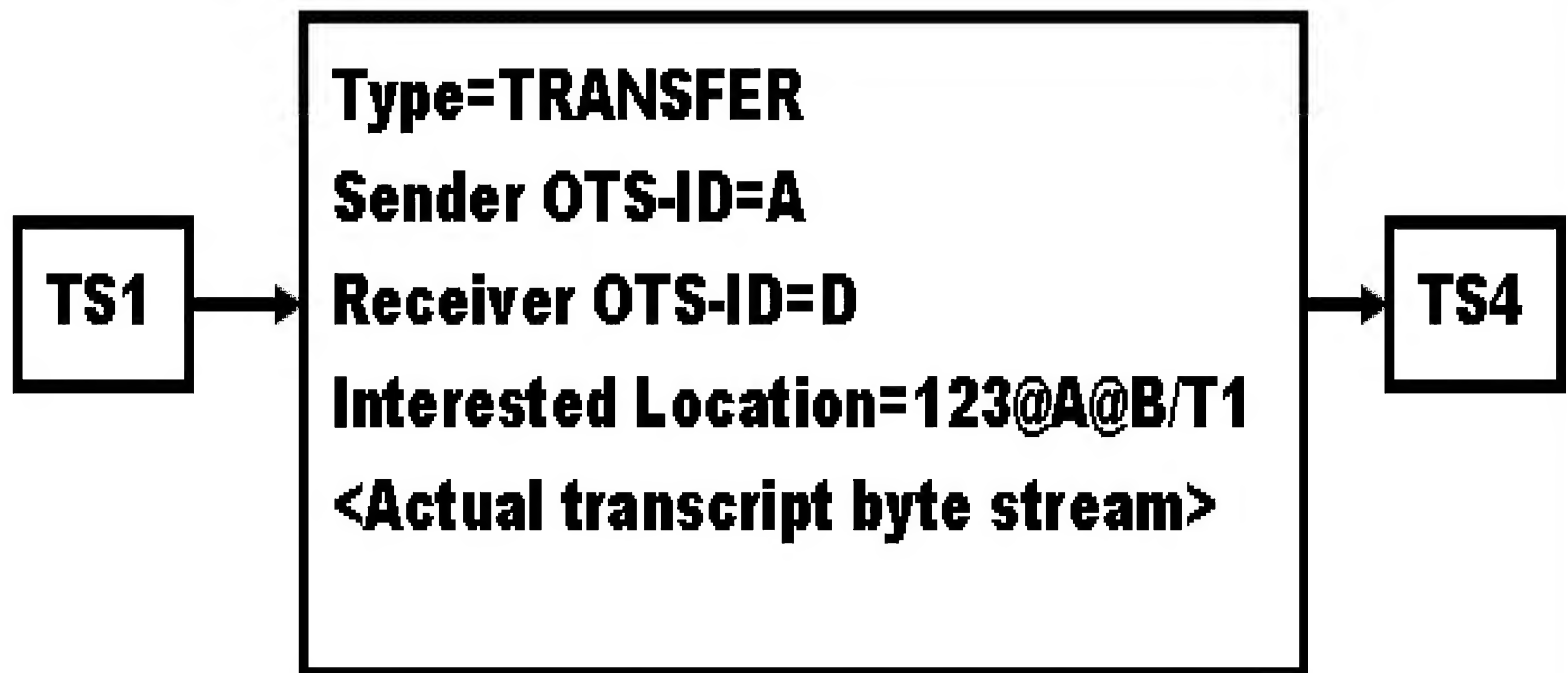
Transfer OTM sent byTS1 to TS2 that completes the view request by B.

TS1 →
```
Type=TRANSFER
Sender OTS-ID=A
Receiver OTS-ID=B
Interested Location=123@A/T1
<Actual transcript byte stream>
```
→ TS2

Fig 8: VPTN

TS 1
(private key for TS 1: TS1PrK)
(public key for TNS : TNSPuK)

1

2

TNS.
(private key: TNSPrK)
(public key for TS1 - > TS1PuK)
(public key for TS2 -> TS2PuK)
...
...

3
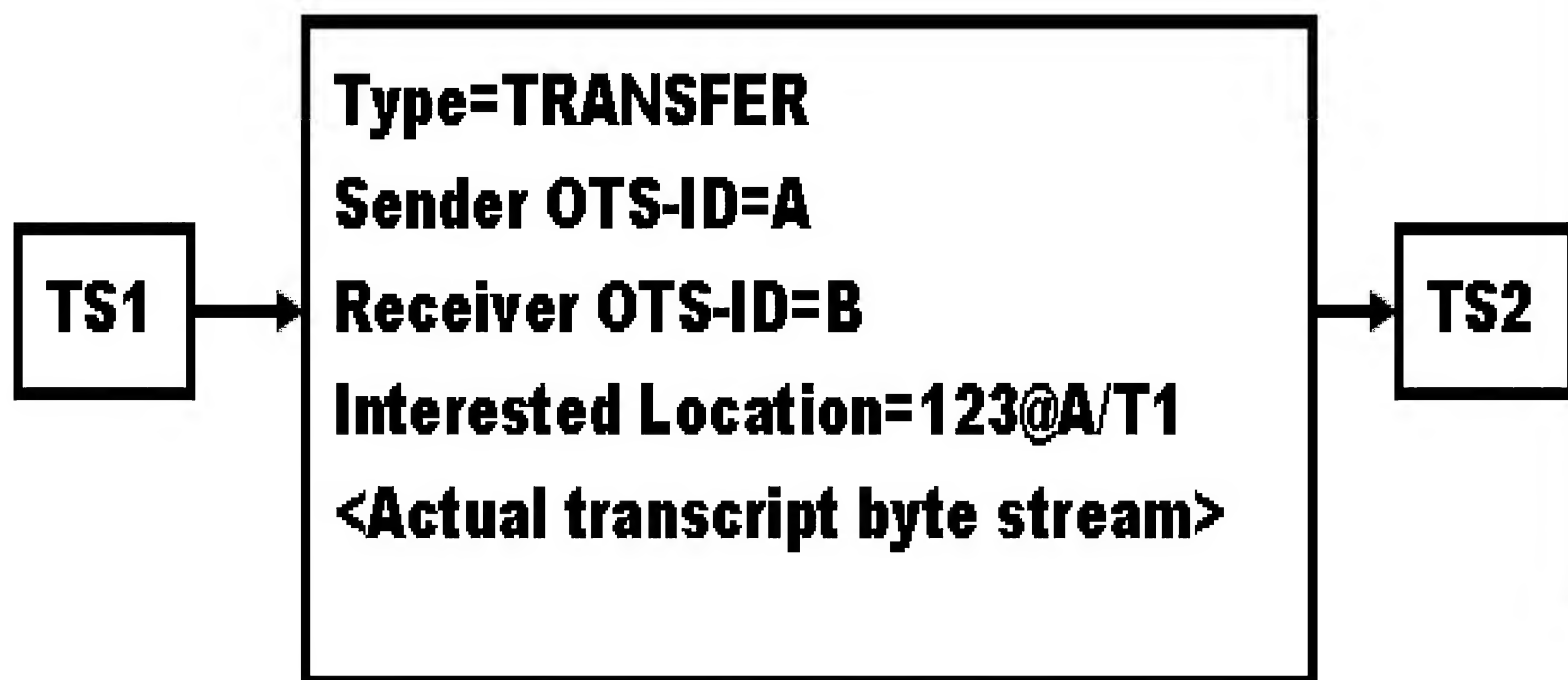
4

TS 2
(private key for TS 2: TS2PrK)
(public key for TNS : TNSPuK)
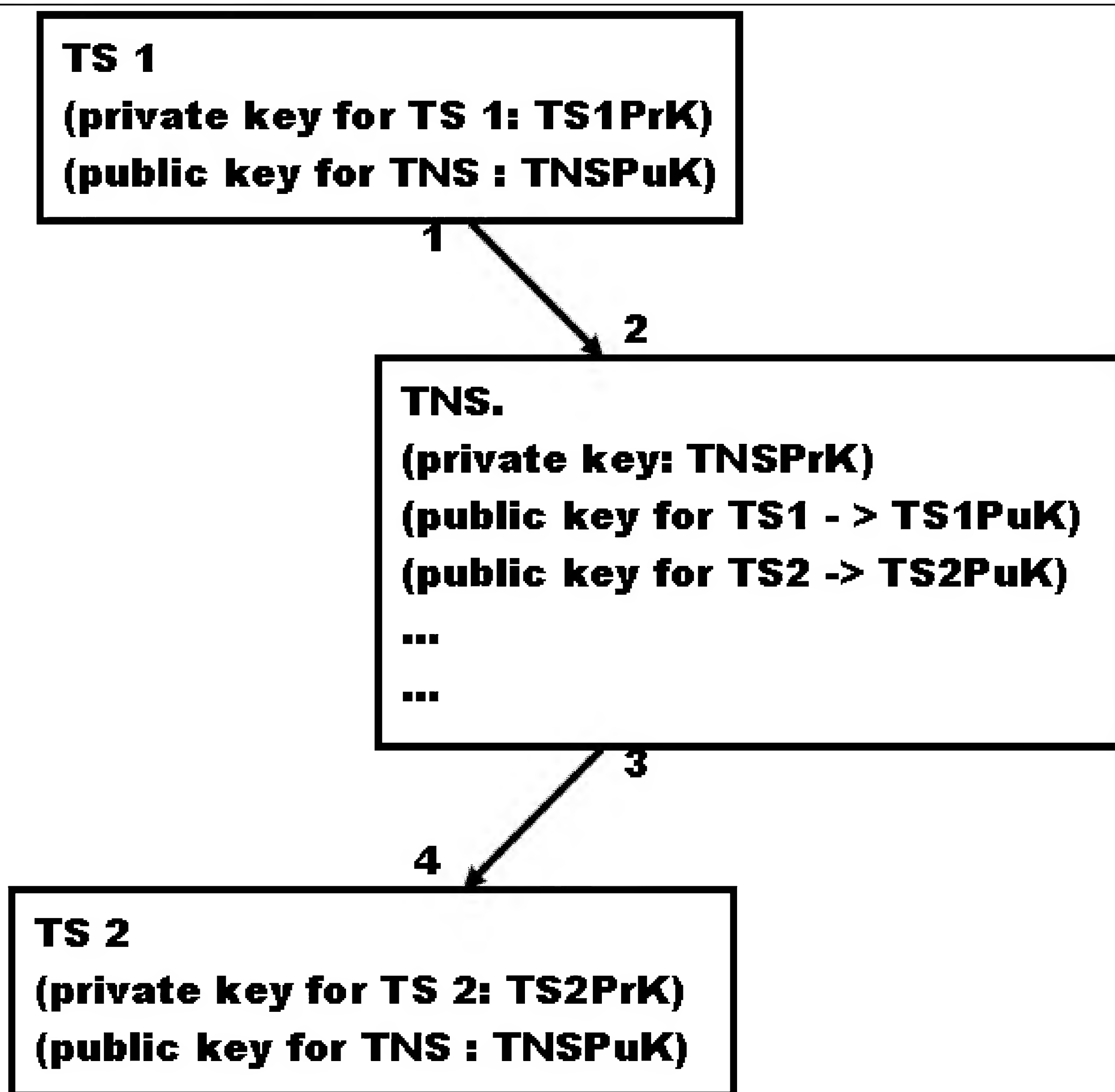
1-> TS1, encrypts with private key TS1PrK.

2-> TNS finds the incoming message to be from host address TS1. It finds public key of TS1 to be TS1PuK. It decrypts the message with TS1PuK.

Confirms sender OTS-ID is from TS1.

3-> Encrypts the message with private key TNSPrK.

Sends it to TS2 hosting the receiver OTS-ID.

4-> TS2 decrypts the message using public key TNSPuK.

Fig 9: Users

Name	Type	Transcript Server	OTS-ID
John Turner	Individual	cadenizen.ots.com	john76
Tecoi Systems	Company	tecoisys.ots.com	tecoisys
Bank Of Trust	Company	bankoft.ots.com	bankoft
Loan Pal	Company	loanpal.ots.com	loanpal
Contra bank	Company	contrab.ots.com	contrab
IRS USG	Company	Irsusg.ots.com	irsusg

Fig 10: OTS state diagram

tecoisys.ots.com

tecoisys — 1, 2

irsusg.ots.com

irsusg — 16

cadenizen.ots.com

john76 — 3, 4, 14, 15

contrab.ots.com

contrab — 9, 10, 7, 8

bankoft.ots.com

loanpal — bankoft — 5, 6

loanpal.ots.com

12, 13, 11
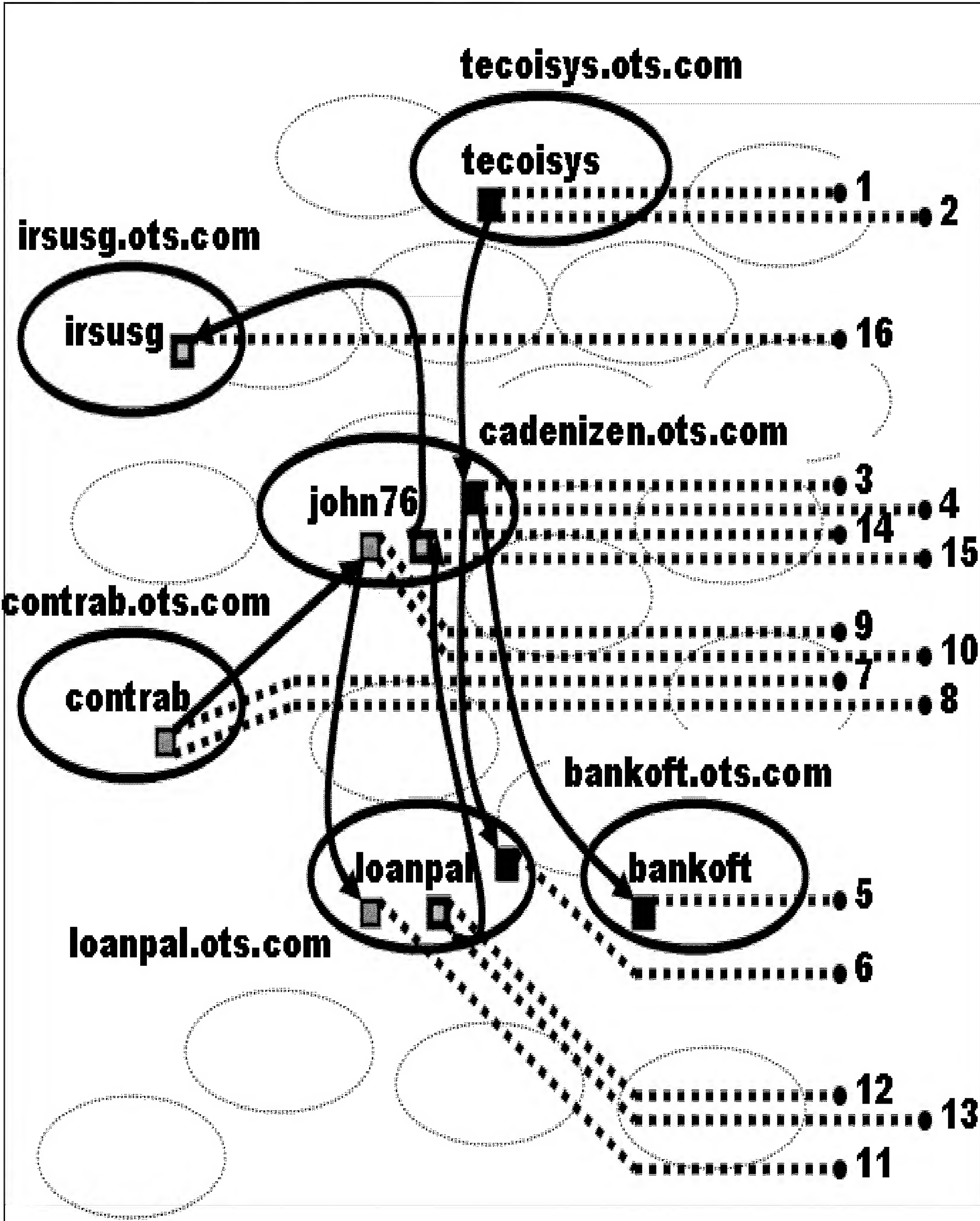
Fig 11: State 1 and 2 relates to OTS-ID →

Transcript Server: tecoisys.ots.com

1--> tecoisys-table

RTL	Description	From OTS-ID
022820041034540	VOE for John Turner	self

1--> 022820041034540-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00\ VOE.pdf	VOE for John Turner	tecoisys: lss	0228200 4103454 00\VOE.p df	self

2--> 022820041034540-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00\ VOE.pdf	VOE for John Turner	tecoisys: lss john76: app	0228200 4103454 00\VOE.p df	self

Transcript Server: cadenizen.ots.com

3—> john76-table

RTL	Description	From OTS-ID
0228200410345400 @tecoisys	VOE for John Turner	tecoisys

3—> 0228200410345400@tecoisys-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00@teco isys\ VOE.pdf	VOE for John Turner	tecoisys: lss john76: app	0228200 4103454 00@tecoi sys\VOE. pdf	tecoisys

4—> 0228200410345400@tecoisys-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00@teco isys\ VOE.pdf	VOE for John Turner	tecoisys: lss john76: app bankoft: Rev loanpal: Rev	0228200 4103454 00@tecoi sys\VOE. pdf	tecoisys

Fig 13: State 5 relates to OTS-ID bankoft ⟶↓

Transcript Server: bankoft.ots.com

5-> bankoft-table

RTL	Description	From OTS-ID
0228200410345400@tecoisys@john76	VOE for John Turner	john76

5-> 0228200410345400@tecoisys@john76-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00@teco isys@ john\ VOE.pdf	VOE for John Turner	tecoisys: lss john76: app bankoft: Rev	0228200 4103454 00@tecoi sys\VOE. pdf	john76

Fig 14: State 6 relates to OTS-ID loanpal ⟶

Transcript Server: loanpal.ots.com

6-> loanpal-table

RTL	Description	From OTS-ID
022820041034540 0@tecoisys@john76	VOE for John Turner	john76

6-> 0228200410345400@tecoisys@john76-transfer-table

Path	Description	Role	Remote Path	Transfer
0228200 4103454 00@teco isys@ john76\ VOE.pdf	VOE for John Turner	tecoisys: lss john76: app loanpal: Rev	0228200 4103454 00@tecoi sys\VOE. pdf	john76

Fig 15: State 7 and 8 relates to OTS-ID ⟶

Transcript Server: contrab.ots.com

7--> contrab-table

RTL	Description	From OTS-ID
030120041234560	Account Statement for John Turner	self

7--> 030120041234560-transfer-table

Path	Description	Role	Remote Path	Transfer
030120041234560\account.pdf	Account Statement for John Turner	contrab: lss	030120041234560\account.pdf	self

8--> 030120041234560-transfer-table

Path	Description	Role	Remote Path	Transfer
030120041234560\account.pdf	Account Statement for John Turner	contrab: lss john76: app	030120041234560\account.pdf	self

Transcript Server: cadenizen.ots.com

9--> john76-table

RTL	Description	From OTS-ID
0228200410345400@tecoisys	VOE for John Turner	tecoisys
0301200411234560@contrab	Account Statement for John Turner	contrab

9--> 0301200411234560@contrab-transfer-table

Path	Description	Role	Remote Path	Transfer
0301200411234560@contrab\account.pdf	Account Statement for John Turner	contrab: lss john76: app	0301200411234560\ account.pdf	contrab

10--> 0301200411234560@contrab-transfer-table

Path	Description	Role	Remote Path	Transfer
0301200411234560@contrab\account.pdf	Account Statement for John Turner	contrab: lss john76: app loanpal: Rev	030120011234560\account.pdf	contrab

Transcript Server: loanpal.ots.com

11-> loanpal-table

RTL	Description	From OTS-ID
022820041034 5400 @tecoisys@john76	VOE for John Turner	john76
030120041234560 @contrab@john76	Account Statement for John Turner	john76

11-> 030120041234560@contrab@john76-transfer-table

Path	Description	Role	Remote Path	Transfer
0301200 4112345 60@ contrab @ john76\ account .pdf	VOE for John Turner	contrab: lss john76: app loanpal: Rev	0228200 4103454 00@ contrab\ account .pdf	john76

Fig 18: State 12 and 13 relates to OTS-ID loanpal →

Transcript Server: loanpal.ots.com

12–> loanpal-table

RTL	Description	From OTS-ID
040120040900200	Loan for John Turner	self

12–> 0401200409002000-transfer-table

Path	Description	Role	Remote Path	Transfer
0401200 4090020 00\ loan.pdf	Loan for John Turner	loanpal: lss	0401200 4090020 00\loan .pdf	self

13–> 0401200409002000-transfer-table

Path	Description	Role	Remote Path	Transfer
0401200 4090020 00\ loan.pdf	Loan for John Turner	loanpal: lss john76: app	0401200 4090020 00\loan .pdf	self

Transcript Server: cadenizen.ots.com

14-> john76-table

RTL	Description	From OTS-ID
02282004103454 00@tecoisys	VOE for John Turner	tecoisys
030120041123 4560@contrab	Account Statement for John Turner	contrab
040120040900 2000@loanpal	Loan for John Turner	loanpal

14-> 04012004 09002000@loanpal-transfer-table

Path	Description	Role	Remote Path	Transfer
0401200 4090020 00@loan pal \ loan.pdf	Loan for John Turner	loanpal: lss john76: app	0401200 4090020 00\loan .pdf	loanpal

15-> 04012004 09002000@loanpal-transfer-table

Path	Description	Role	Remote Path	Transfer
04012004 09002000 @loanpal\ loan.pdf	Loan for John Turner	loanpal: lss john76: app irsusg: rev	040120040 9002000\ loan .pdf	loanpal

Fig 20: State 16 relates to OTS-ID irsusg

Transcript Server: irsusg.ots.com

16-> irsusg-table

RTL	Description	From OTS-ID
040120040900 2000@loanpal@ john76	Loan for John Turner	john76

0401200409002000@loanpal@john76-transfer-table

Path	Description	Role	Remote Path	Transfer
04012004 09002000 @loanpal@ john76\ loan.pdf	Loan for John Turner	loanpal: lss john76: app irsusg: rev	040120040 9002000@ loanpal\ loan .pdf	john76